Claim 24 reads:

A coated nanocrystal capable of light emission, comprising:
a core comprising a first semiconductor material, said core being a member of a **monodisperse particle population**; and
an overcoating uniformly deposited on the core comprising a second semiconductor material,
wherein the first semiconductor material and the second semiconductor material are the same or different, and wherein the **monodisperse particle population** is characterized in that when irradiated the population **emits light** in a spectral range of no greater than **about 60 nm** full width at half max (FWHM).

Claim 25 reads:

A coated nanocrystal capable of light emission, comprising:
a core comprising a first semiconductor material, said core being a member of a **monodisperse particle population**; and
an overcoating uniformly deposited on the core comprising a second semiconductor material,
wherein the first semiconductor material and the second semiconductor material are the same or different, and wherein the **monodisperse particle population** is characterized in that it **exhibits** no more than about a **10% rms** deviation in the diameter of the core.

Applicants have highlighted several features of the claimed coated nanocrystals which will be further discussed below.

Claims 3-14 and 26-42, which depend directly or indirectly from either independent claim 24 or claim 25, also cover coated nanocrystals having the highlighted features.

The Rejection

In the Final Office Action, the Examiner rejected claims 1-14 and 24-42 under 35 U.S.C. § 102(b) as being anticipated by "Nucleation and Growth of CdSe on ZnS Quantum Crystallite Seeds, and Vice Versa, in Inverse Micelle Media" by Kortan el al. ("Kortan et al.").[1]

In making this rejection, the Examiner states:

> Monodisperse particle population of the core is the only argument made by applicant. Applicant asserted that the CdSe seed as prepared by Kortan's method is not a monodisperse particle. However, applicant did not explain why it is not. CdSe as described in the Kortan reference as a single crystallite (or in other words, mono-crystallite), and thus it inherently comprises a monodisperse particle population (Final Office Action at page 2, lines 4-8).

[1] Applicants note that claims 1 and 2 have been canceled.

Applicants do not understand the Examiner's comments. In particular, Applicants fail to see how the crystalline nature of a material is related to the **size** of the crystal or the **distribution of sizes** of a plurality of crystalline materials. It does not follow that single crystal core materials, i.e., a plurality of mono-crystals, inherently have a **monodisperse particle population**. The term monodisperse is defined in the Specification at page 5, lines 26-28, as "a colloidal system in which the suspended particles have substantially identical size and shape." Applicants have further defined a **monodisperse particle population** as a plurality of particles which deviate less than 10%, and preferably less than 5% in rms diameter. Moreover, a **monodisperse particle population** also emits light in a range no greater than 60 nm, preferably 40 nm, and most preferably 30 nm at full width half max (FWHM). See, for example, the specification at page 5, line 25 through page 6, line 26.

Applicants submit that Koran et al. does not disclose or suggest core materials of a **monodisperse particle population.** Furthermore, Kortan et al. does not suggest a method of producing core materials of a **monodisperse particle population.** Rather, Kortan et al. teaches using "seed" crystallite particles produced from the methodology described in "Surface Derivatization and Isolation of Semiconductor Cluster Molecules" by Steigerwald et al. See, for example, Kortan et al. at page 1328 and reference 4. In fact, "seed" crytsallite particles produced by Steigerwald et al. deviate by **25% rms in diameter.** See Steigerwald et al. at page 3048, column 1 (copy attached as Exhibit A). Therefore, the core material in Kortan et al. having a rms diameter of greater than 10% is not a **monodisperse particle population**.

Moreover, Kortan et al. provides spectroscopic characteristics of the core materials: "[t]he initial CdSe seed shows extremely weak **broad** visible emission similar to that of Figure 2A" (at page 1328, 2nd column; emphasis added; copy attached as Exhibit B). Indeed, the FWHM of the emission produced by the core materials of Kortan et al. is approximately 200 nm. As shown in Figure 2 of the present specification, CdSe core materials of a **monodisperse particle population** exhibit emission in a range no greater than about 60 nm FWHM (copy attached as Exhibit C). Thus, the core materials of Kortan et al., which have a FWHM of the emission of the core material of greater than about 60 nm are also not a **monodisperse particle population**.

For at least the reasons stated above, Applicants submit that claims 3-14 and 24-42 are patentable over Kortan et al.

If the Examiner has any concerns or questions about the above remarks, Applicants are more than willing to discuss them over the phone. Communication should be directed to Y. Rocky Tsao at 617-542-5070.

Applicants submit that the grounds for rejection asserted by the Examiner have been overcome, and that the claims, as now pending, define subject matter that is novel and nonobvious over cited the prior art. On this basis, it is submitted that allowance of the present application is proper, and early favorable action is solicited.

Please apply any charges or credits to Deposit Account No. 06-1050

Respectfully submitted,

Date: 4-20-00

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